SUBJECT: Abbreviated Ecological Hazard Assessment for J15-8 to 12

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********** [redacted] **********

I. INTRODUCTION

The Agency has received a Microbial Commercial Activity Notice from Taurus Energy AB, for five intergeneric strains of *Saccharomyces cerevisiae* for [redacted].

[redacted]

II. TAXONOMY AND CHARACTERIZATION

A. Recipient Microorganism

The recipient strain for all MCANs was [redacted] from *Saccharomyces cerevisiae*. *Saccharomyces cerevisiae* has an extensive history of use in the area of food processing. Also known as baker's yeast or brewer's yeast, this organism has been used for centuries as leavening for bread and as a fermenter of alcoholic beverages. The risk assessment of *S. cerevisiae* for the 5(h)(4) Tiered Exemptions Final Risk Assessment for *S. cerevisiae:* (http://www.epa.gov/oppt/biotech/pubs/pdf/fra002.pdf)

[redacted]

Although it is associated with human activity from bread baking and fermentation of alcoholic beverages, *S. cerevisiae* is widespread in nature. It has been recovered from a variety of sites such as soils, sediments, and plant material under different ecological conditions. *S. cerevisiae* is frequently recovered from fresh fruits and vegetables, generally those fruits with high levels of fermentable sugars. In the environment, yeasts can be dispersed by insects, particularly fruit flies (Gilbert, 1980).

B. Donor Microorganism

The donor microorganisms were *Saccharomyces cerevisiae* and *Scheffersomyces* (*Pichia*) *stipitis*. *S. stipitis* is a species of yeast and is able to ferment xylose to ethanol. *S. stipitis* is found in plants and in the guts of passalid beetles.

III. ECOLOGICAL HAZARDS

A. Recipient Microorganism

The recipient microorganism does not pose any pathogenicity/toxicity concerns to plants or animals. It is a benign yeast with a long history of safe use that is ubiquitous in the environment. The risk assessment of *S. cerevisiae* for the 5(h)4 Tiered Exemption stated that there are low ecological hazards associated with this microorganism.

B. Submission Microorganism

[redacted]

[redacted]

IV. CONCLUSIONS

There are low ecological hazards associated with the use of the five production strains of *S. cerevisiae* for cellulosic ethanol production. The recipient microorganism does not pose ecological concerns, nor does the introduced genetic material. The submission microorganism does not contain any introduced antibiotic resistance genes.

REFERENCES

Gilbert, D.G. 1980. Dispersal of yeasts and bacteria by *Drosophilia* in a temperate rain forest. Oecologia 46:135-37.

McClung, G. 2015. Construct Hazard Report for J15-08 to -12. Office of Pollution Prevention and Toxics. U.S. Environmental Protection Agency, Washington, DC.

McMillan, J.D. 1993. Xylose Fermentation to Ethanol: A Review. National Renewable Energy Laboratory, Golden, CO. NREL/TP-421-4944.

Segal, M. 2015. Genetic Construction Report for J15-08 to -12. Office of Pollution Prevention and Toxics. U.S. Environmental Protection Agency, Washington, DC.